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EXAMINER	
LIN, JAMES	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/607,915	KOBAYASHI, YOSHIHIRO	
	Examiner	Art Unit	
	Jimmy Lin	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 December 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *12,17 and 18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *12,17 and 18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 12 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sarnecki (U.S. Patent Application Publication No. 2003/0089252) in view of Snider (U.S. Publication No. 2001/0003222), Park et al. (U.S. Patent No. 5,053,298), and Roitman (U.S. Patent No. 5,972,419). Miyashita et al. (U.S. Publication No. 2001/0001050) is used as a teaching reference.

Sarnecki teaches forming an electroluminescent (EL) element by intaglio printing a light-emitting material [0008],[0010]. The film can be printed with a thickness in the range of 10 nm to 1 μm (i.e., 100 Å to 10,000 Å, which fully encompasses the claimed range). Xylene can be used as a solvent [0020].

Sarnecki does not explicitly teach that the ink has a viscosity of 0.5-500 cP. Sarnecki is completely silent about an operable viscosity range, but does teach that the viscosity should be chosen to be a suitable viscosity for gravure printing [0020]. Accordingly, Snider teaches that viscosities of no more than 500 cP can be used in gravure printing (abstract) and that such a viscosity range is able to form a uniform film [0022]. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have chosen a viscosity of less than 500 cP as the particular viscosity of Sarnecki with a reasonable expectation of success. One would have been motivated to do so in order to have formed a uniform film. Sarnecki teaches the need to form a uniform film [0006].

Sarnecki teaches that multiple colors are applied and that each color is dried (i.e., hardened) before the next color is applied [0022], but does not teach that a later color is printed after a protective layer is placed over the already printed colors. However, Park teaches that in printing different colored pixels, each pixel should be covered to protect it during the deposition

of the subsequent pixel (col. 3, line 29-col. 4, line 28). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have covered each pixel with a protective film before printing the subsequent pixel because Park teaches that such is a suitbale method for protecting each already-deposited pixel during the deposition of subsequent pixels.

Sarnecki does not explicitly teach that the depth of the groove or a cell of the intaglio is in a range of 500 Å to 1 mm, but does teach that the depth of the cells is a result-effective variable because it controls the thickness of the film formed [0011]. It has been held that the discovery of the optimum value of a result effective variable in a known process is ordinarily within the skill in the art. *In re Boesch and Slaney*, 205 USPQ 215 (CCPA 1980). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have optimized the depth of the cells of Sarnecki through routine experimentation in order to have achieved the desired thicknesses in the range of 10 nm to 1 μm.

Sarnecki does not explicitly teach a contact angle of the light-emitting layer forming coating solution with a base material, on which the light-emitting layer is formed, is 20° or less. Sarnecki does teach that the light-emitting material droplets are printed into desired patterns. These patterns comprise of areas where light-emitting material is to be deposited and areas where light-emitting material is *not* deposited ([0040]; Fig. 1A). Accordingly, Roitman teaches that it was well known in the art to form hydrophilic and hydrophobic regions in order to confine light-emitting material droplets to form a desired pattern (col. 4, lines 56-59). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have formed hydrophilic and hydrophobic regions on the substrate of Sarnecki with a reasonable expectation of success. One would have been motivated to do so in order to have further confined the droplets to a desired pattern. The light-emitting material droplets would easily wet the regions in which they are to be deposited, and would repel regions in which they are not to be deposited. The high wettability of the droplets to the deposited regions would necessarily create a low contact angle of the droplet relative to the base material because the degree of wettability is inversely proportional to the contact angle (see, e.g., Miyashita, [0095]). One of ordinary skill in the art would have recognized that any degree of wettability and/or contact angle would be operable so long as the deposited regions have greater attraction to the light-emitting material

droplet than the regions not to be deposited onto. Thus, it would have been obvious to one of ordinary skill in the art at the time of invention to have used any degree of contact angle, including that of the claimed range, of the droplet with respect to the base material with a reasonable expectation of success.

Claim 17: Sarnecki teaches that the intaglio is formed into plural cells to print pixels [0009],[0011].

Claim 18: Sarnecki teaches that separate stations may be used for each color [0022]. Thus, the area of the group of cells that provide ink from one printing plate is smaller than the total area of the light emitting layer on the formed device because the total area of the light emitting pixels comprises all three colors.

3. Claims 12 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki et al. (U.S. Patent No. 6,940,223) in view of Park '298, Yamazaki et al. (U.S. Patent No. 6,830,494), Roitman '419, and Sarnecki '252. Miyashita '050 is used as a teaching reference.

Yamazaki '223 discloses a method of making an EL element by letterpress printing (col. 3, lines 35-41). The viscosity of the EL solution can be in a range of $1x10^{-3}$ to $5x10^{-2}$ Pa·s (i.e., 1 to 50 cP) (col. 4, lines 22-32). The solvent in the EL solution can be xylene (col. 4, lines 34-39). The EL layer can be deposited to a thickness in the range of 30 to 150 nm (i.e., 300 to 1500 Å). Divisional coatings of two or more colors can be possible (Figs. 8A-8D).

Yamazaki '223 teaches that different colors can be applied separately (Figs. 8A-8D), but does not teach that a later color is printed after a protective layer is placed over the already printed colors. However, Park teaches that in printing different colored pixels, each pixel should be covered to protect it during the deposition of the subsequent pixel (col. 3, line 29-col. 4, line 28). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have covered each pixel with a protective film before printing subsequent pixels of Yamazaki '223 with a reasonable expectation of success because Park teaches that such a method was operable for protecting each already-deposited pixel during the deposition of subsequent pixels.

Yamazaki '233 teaches that different colors can be applied separately (Figs. 8A-8D) and that the EL layers are dried (col. 21, lines 33-38), but does not explicitly teach that a previous EL color layer is solidified prior to the subsequent deposition of another EL color. Yamazaki '494 teaches that EL layers can be dried all at once or every time one EL color is deposited (col. 12, lines 21-32). The teachings of Yamazaki '494 would have presented a recognition of equivalency in the prior art and would have presented strong evidence of obviousness in substituting one method for the other in a process of drying EL layers. The substitution of equivalents requires no express suggestion. See MPEP 2144.06.II. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have performed a drying process after each EL color of Yamazaki '233 is deposited with a reasonable expectation of success.

Yamazaki '223 does not explicitly teach a contact angle of the light-emitting layer forming coating solution with a base material, on which the light-emitting layer is formed, is 20° or less. Yamazaki '223 does teach that the light-emitting material droplets are printed into desired patterns. These patterns comprise of areas where light-emitting material is to be deposited and areas where light-emitting material is *not* deposited (col. 20, line 35-col. 21, line 8). Accordingly, Roitman teaches that it was well known in the art to form hydrophilic and hydrophobic regions in order to confine light-emitting material droplets to form a desired pattern (col. 4, lines 56-59). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have formed hydrophilic and hydrophobic regions on the substrate of Yamazaki '223 with a reasonable expectation of success. One would have been motivated to do so in order to have further confined the droplets to a desired pattern. The light-emitting material droplets would easily wet the regions in which they are to be deposited, and would repel regions in which they are not to be deposited. The high wettability of the droplets to the deposited regions would necessarily create a low contact angle of the droplet relative to the base material because the degree of wettability is inversely proportional to the contact angle (see, e.g., Miyashita, [0095]). One of ordinary skill in the art would have recognized that any degree of wettability and/or contact angle would be operable so long as the deposited regions have greater attraction to the light-emitting material droplet than the regions not to be deposited onto. Thus, it would have been obvious to one of ordinary skill in the art at the time of invention to have used

any degree of contact angle, including that of the claimed range, of the droplet with respect to the base material with a reasonable expectation of success.

Yamazaki '223 teaches that the EL solution can be deposited by letterpress printing (col. 3, lines 35-41), but does not explicitly teach the use of intaglio printing. However, Fujita teaches that the letterpress printing method was operable equivalent to an intaglio printing method in the art of forming EL devices (col. 8, lines 41-50). The teachings of Fujita would have presented a recognition of equivalency in the prior art and would have presented strong evidence of obviousness in substituting one method for the other in a process of printing an EL solution. The substitution of equivalents requires no express suggestion. See MPEP 2144.06.II. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have used an intaglio printing method, as opposed to a letterpress printing method, to manufacture the EL device of Yamazaki '223 with a reasonable expectation of success.

Yamazaki '223 and Fujita do not explicitly teach that the depth of the groove or a cell of the intaglio is in a range of 500 Å to 1 mm. However, Sarnecki teaches that the depth of the cells in an intaglio printing method is a result-effective variable because it controls the thickness of the film formed [0011]. It has been held that the discovery of the optimum value of a result effective variable in a known process is ordinarily within the skill in the art. *In re Boesch and Slaney*, 205 USPQ 215 (CCPA 1980). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have optimized the depth of the cells of Yamazaki '223 and Fujita through routine experimentation in order to have achieved the desired thicknesses in the range of 30 to 150 nm.

Claim 17: Yamazaki '223 teaches that the printing of the EL solution uses multiple printing portions (Figs. 8A-8D).

Claim 18: Yamazaki '223 teaches that each EL color can be printed separately (Figs. 8A-8D). Thus, the area of the group of cells that provide ink from one printing plate is smaller than the total area of the light emitting layer on the formed device because the total area of the light emitting pixels comprises all three colors.

New Grounds of Rejections

4. Claims 17-18 are being added to the rejection over Sarnecki, Snider, Park, and Roitman. The rejections of the claims were omitted in the previous Office Action filed 8/29/2008.

5. The rejection of claims 12 and 17-18 over Yamazaki '223, Park, Yamazaki '494, Roitman, and Sarnecki has been added.

Response to Arguments

6. Applicant's arguments filed 12/24/2008 have been fully considered but they are not persuasive.

Applicant argues on pg. 4-5 that the light emitting layer forming coating solution in the cells of the intaglio plate wet and spread after it is transferred onto a body to be printed, as exemplified in Figs. 1A-1B. However, the claims are not limited to having such a feature occur. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See In re Van Geuns, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant argues on pg. 5-6 that it is likely that Sarnecki uses relatively high viscosity ink such as an ink used in conventional gravure printing. Applicant is correct in that Sarnecki teaches adjusting the viscosity to a suitable viscosity for gravure printing. However, Sarnecki is silent to the viscosity of conventional gravure printing inks. The rejection relies on Snider to teach that viscosities of no more than 500 cP can be used in gravure printing (abstract). Thus, one of ordinary skill in the art would have recognized that Snider teaches a suitable viscosity for gravure printing that can be used in the method of Sarnecki with a reasonable expectation of success.

Applicant argues on pg. 6 that the ink of Snider is "a suspension of at least one disperse dyestuff in a solution of a thickener in water" and that Snider discloses a process of producing a colored polyester film. Applicant continues to argue that Snider is different from the present invention, including the solvent used in the ink, solute dissolved or dispersed into the solvent, and thickness of the obtained film. However, Sarnecki explicitly teaches that "[t]he OLEP...is dispersed or dissolved in a carrier solvent...to a suitable viscosity for gravure printing" and that "[t]he printing viscosity can also be adjusted according to the methods describe in Towns et al.,

U.S. Pat. No. 6,153,711". Sarnecki does not limit the viscosity to be one that is used in an EL method, but rather a gravure process in general. One of ordinary skill in the art would have recognized that any viscosity used for any gravure printing method would have been operable in the method of Sarnecki and that the viscosity can be adjusted according to the method of Towns. Thus, there is no requirement for a teaching of a viscosity in a gravure printing method to be in the art of making EL devices.

Applicant argues on pg. 7 that both Roitman and Miyashita are related to wettability and contact angle in case of using noncontact dispenser and that those skilled in the art would know that there is no use to apply such disclosure to the printing method using an intaglio. However, Roitman and Miyashita are related to a solution coating method. One of ordinary skill in the art would have recognized that modifications to the substrate in a solution coating method would have been applicable and operable in an intaglio method, which is also a solution coating method.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jimmy Lin whose telephone number is (571)272-8902. The examiner can normally be reached on Monday thru Friday 8AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jimmy Lin/

Examiner, Art Unit 1792

/Timothy H Meeks/
Supervisory Patent Examiner, Art Unit 1792